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MAY 14 2001

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Rau et al

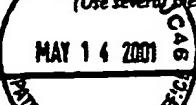
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1/11/2001

Group Art Unit

091759,7B1

2764-1754



## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
WAL	A1	3,511,595	5/12/70	Fuchs	23	4	
WAL	A2	3,660,023	5/2/72	Frevel et al	23	150	
WAL	A3	3,883,639	5/13/75	Cronkright et al	423	24	
WAL	A4	3,988,422	10/26/76	Kruger	423	232	MAY 17 2001
WAL	A5	4,160,810	7/10/79	Benson et al	423	220	TC 1700
WAL	A6	4,187,279	2/5/80	Rimpl	422	185	
WAL	A7	4,247,525	1/27/81	Voeste	423	242	
WAL	A8	4,272,498	6/9/81	Faatz	423	242	
WAL	A9	4,367,258	1/4/83	Lagana et al	423	221	
WAL	A10	4,376,101	3/8/83	Sartori et al	423	223	
WAL	A11	4,376,102	3/8/83	Thaler Et al	423	223	

## FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
							YES	NO
WAL	B1	WO9825688	6/18/98	European patent	B01D53	62		
WAL	B2	GB2284203	5/31/95	United Kingdom	B01D53	62		
WAL	B3	EP 487102	5/27/92	EPO	B01D53	34		
WAL	B4	GB819215	9/2/59	Germany	55	2		
WAL	B5	GB1305718	2/7/72	United Kingdom	B01D53	34		

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)


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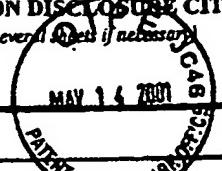
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U.S. PATENT DOCUMENTS

EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
WYL	A12	4,405,578	9/20/83	Sartori et al	423	223	
WYL	A13	4,496,371	1/29/85	Urban et al	48	197	
WYL	A14	4,510,124	4/9/85	Sears et al	423	437	
WYL	A15	4,708,855	11/24/87	Morrison	423	223	
WAL	A16	4,716,027	12/29/87	Morrison	423	225	RECEIVED 12/29/2001
WAL	A17	5,006,323	4/9/91	Johnson	423	244	12/29/2001
WAL	A18	5,059,406	10/22/91	Sheth et al	423	244	12/29/2000
WAL	A19	5,100,633	3/31/92	Morrison	423	225	
WYL	A20	5,192,518	3/9/93	Ukawa et al	423	244.08	
WYL	A21	5,261,490	11/16/93	Ebinuma	166	266	
WAL	A22	5,429,808	7/4/95	Kuroda et al	422	176	

FOREIGN PATENT DOCUMENTS

REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
						YES	NO
WAL	WO9855210	12/10/98	European patent	B01D53	62		

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)


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## **U.S. PATENT DOCUMENTS**

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## **FOREIGN PATENT DOCUMENTS**

**OTHER DOCUMENTS** (Including Author, Title, Date, Pertinent Pages, Etc.)

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## **EXAMINER**

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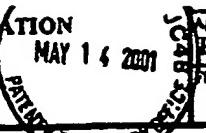
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Applicant(s)  
Rau et al

Filing Date

1/11/2001

Group Art Unit

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EXAMINER INITIAL	OTHER DOCUMENTS (Include Author, Title, Date, Periodical Pages, Etc.)
WAL C1	"Carbon Dioxide Recovery and Disposal From Large Energy Systems", H. Herzog and E. Drake, published in Annual Reviews of Energy and Environment Vol. 21, p 145-166, dated 1996. (no month)
WAL C2	"Mitigation of CO <sub>2</sub> by Chemical Conversion: Plausible Chemical Reactions and Promising Products", J. M. Wilson and J.A. Moulijn, published in Energy and Fuels, Vol. 10, No. 2, p 305-325, dated 1996. (no month)
WAL C3	"The Fixation of Carbon Dioxide in Inorganic and Organic Chemicals", M. Aresta, published in Energy Conversion and Management, Vol. 34, No. 9-11, p. 745-752, dated 1993. (no month) IC 1700
WAL C4	"The Carbonate-Silicate Geochemical Cycle and its Effect on Atmospheric Carbon Dioxide Over the Last 100 Million Years", R.A. Berner, A.C. Lasaga, and R.M. Garrels, published in American Journal of Science, Vol. 283, p 641-683, dated September 1983.
WAL C5	"Marine Carbonate Formations: Their role in Mediating Long-Term Ocean-Atmosphere Carbon Dioxide Fluxes - A Review", C.N. Murray and T.R.S. Wilson, published in Energy Conversion and Management, Vol. 38, Suppl., p. S287-S294, dated 1997. (no month)
WAL C6	"Multiple timescales for neutralization of fossil fuel CO <sub>2</sub> ", D. Archer, H. Kesseli, and E. Maier-Reimer, published in Geophysical Research Letters, Vol. 24, No. 4, p. 405-408, dated February 15, 1997.
WAL C7	"CO <sub>2</sub> Fixation by Artificial Weathering of Waste Concrete and Coccolithophorid Algae Cultures", H. Takano and T. Matsunaga, published in Energy Conversion Management, Vol. 36, No. 6-9, p 697-700, dated 1995. (no month)
WAL C8	"Evaluation Strategies for Chemical and Biological Fixation/Utilization Processes of Carbon Dioxide", T. Kojima, published in Energy Conversion Management, Vol. 36, No. 6-9, p 881-884, dated 1995. (no month)
WAL C9	"Absorption and Fixation of Carbon Dioxide by Rock Weathering", T. Kojima, A. Nagamine, N. Ueno and S. Uematsu, published in Energy Conversion Management, Vol. 38, Suppl., p S461-S466, dated 1997. (no month)
WAL C10	"Carbon Disposal in Carbonate Minerals", K.S. Lackner, C.H. Wendt, D.P. Butt, E.L. Joyce, D.H. Sharp, published in Energy, Vol. 20, No. 11, p 1153-1170, dated 1995. (no month)
WAL C11	"Progress on Binding CO <sub>2</sub> in Mineral Substrates", K.S. Lackner, D.P. Butt, and C.H. Wendt, published in Energy Conversion and Management Vol. 38, No. 11, p S259-S264, dated 1997. (no month)
WAL C12	"CO <sub>2</sub> Recovery From Flue Gas by an Ecotechnological (Environmentally Friendly) System", T. Chobaji, M. Tabata, and E. Hirai, published in Energy, Vol. 22, No. 2/3, p 151-159, dated 1997. (no month)

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DATE CONSIDERED

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1/11/2001

Group Art Unit

1764 1754

091759, 781

EXAMINER INITIAL	OTHER DOCUMENTS (Name, Authorship, Title, Date, Pertinent Pages, Etc.)
WAL C13	"Sequestering Atmospheric Carbon Dioxide by Increasing Ocean Alkalinity", H. Kheshgi, published in Energy, Vol. 20, No. 9, p.915-922, dated 1995 (no month) RFC FIVED
WAL C14	H. N. Soud and M. Takesita, FCD Handbook, Second Edition, IEA Coal Research, London, chapter 3, p. 25-43, dated January 1994 MAY 17 2001
WAL C15	"Geochemistry of Sedimentary Carbonates", Elsevier Science Publishers, p. 1-10, 72-86, dated 1990 (no month)
WAL C16	"A Continuous and Mechanistic Representation of Calcite Reaction-Controlled Kinetics in Dilute Solutions at 25°C and 1 Atm Total Pressure", T. Arakaki and A. Mucci, published in Aquatic Geochemistry, Vol. 1, p 105-130, dated 1993 (no month)
WAL C17	"CO <sub>2</sub> Capture, Reuse, and Storage Technologies for Mitigating Global Climate Change, Herzog et al, White Paper, p 34, dated January 1997
WAL C18	"A Geological Perspective on Global Warming and the Possibility of CO <sub>2</sub> Removal as Calcium Carbonate Mineral", Dunsmore, Energy Conversion Management, Vol 33, No. 5-8, p 565-572, dated 1992 (no month)
WAL C19	"Carbon Sequestration - State of the Science", Working paper for roadmapping future carbon sequestration R&D, U.S. DOE Office of Science/Office of Fossil Energy, dated February 1999, p 3-13 to 3-15
WAL C20	IEA 2000 "Capture of CO <sub>2</sub> Using Water Scrubbing", International Energy Agency, Gloucestershire, UK, pg. 2-4 and 2-5 describes work of Rau and Caldeira (no date)
WAL C21	U.S. Dept. of Energy report, 1999. Carbon Sequestration Research and Development. U.S. Dept. of Energy, Wash., D.C, page 3-14 (no month)
WAL C22	Woag, C.S. and S. Hirai, 1997. Ocean Storage of Carbon Dioxide - A Review of Oceanic Carbonate and CO <sub>2</sub> hydrate Chemistry. International Energy Agency, Cheltenham, UK, pg. 54-58 (no month)
WAL C23	Golomb, G. and A. Angelopoulos, "A Benign Form of CO <sub>2</sub> Sequestration in the Ocean", 5th International Conf on Greenhouse Gas Control Technologies (no date)
WAL C24	Smith, H.J. 2000. Ocean Dumping of CO <sub>2</sub> . Science 287: 769 (no date)
EXAMINER	DATE CONSIDERED Maynard Langford 1-24-05

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154-7254

MAY 17 2001

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## OTHER DOCUMENTS

(including Author, Title, Date, Previous Pages, Etc.)  
RECORDEDColomb D. 1997. A fizz-diss solution: Use limestone to cure lake's CO<sub>2</sub> problem, Physics Today 50 (2): 15-15

TC 1700

WAL

C5.

(no month)

WAL

Rau and Caldeira, Science and Technology Review, December 1998, entitled "Energy To Keep Everything Running",

D1

WAL

an abstract entitled "Geochemical implications of the carbonate-dissolution method for ocean disposal of carbon dioxide" describing this invention was presented by one of the inventors at the "Second International Symposium on CO<sub>2</sub> in the Ocean" conference January 18-22, 1999 in Tsukuba, Japan.

D2

WAL

Rau and Caldeira, Lawrence Livermore National Laboratory (LLNL) report UCRL-JC-132228. Entitled "Enhanced Carbonate Dissolution: A Means of Sequestering Waste CO<sub>2</sub> as Ocean Bicarbonate", it was catalogued by the LLNL library on March 15, 1999, also published in Energy Conversion and Management, vol. 40, 1999, pp. 1803-1813.

D3

WAL

Nojiri, Y. 1999. Proceedings of the 2nd International Symposium: CO<sub>2</sub> in the Oceans. National Institute for Environmental Studies, Tsukuba, Japan. pg. 429.

D4

WAL

Rau and Caldeira, Geophysical Research Letters, January 15, 2000, Vol. 27, No. 2, entitled "Accelerating carbonate dissolution to sequester carbon dioxide in the ocean: Geochemical implications", pp.225-228.

D5

WAL

Rau, G.H. and K. Caldeira. Enhanced carbonate dissolution as a means of sequestering carbon dioxide in the ocean. Transaction, American Geophysical Union 80(49): 213, December 7, 1999,

D6

WAL

Rau, G.H., B. Dowsa, K. Caldeira, and H. Sarv. Enhanced carbonate dissolution as a means of sequestering carbon dioxide in the ocean. Transaction, American Geophysical Union 81(48): 283, November 28, 2000.

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EXAMINER

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1-24-05

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